

1. The amendment filed on 1/14/10 is entered and made of record.

2. Response to Applicant's Arguments

I. On page 5 of the reply, the applicant stated:

"Monjo fails to disclose or suggest, among other things, "a second image pickup step to pickup an image of the object positioned in front of the background using wavelengths in an infrared region" and "wherein at least a surface of the background is formed by an organic dye," as is recited in independent claim 1 ... Arai does not disclose or suggest, among other things, "a second image pickup step to pickup an image of the object positioned in front of the background using wavelengths in an infrared region" and "wherein at least a surface of the background is formed by an organic dye," as is recited in independent claim 1."

The examiner did not rely on Monjo (US pat no 6,490,006) nor Arai (US pat no 5,258,275) to disclose such feature. Smoot (US pat no 5,940,139) discloses a first image pickup step to pick up an image of an object positioned in front of a background using wavelengths in a visible light region; a second image pickup step to pick an image of the object positioned in front of the background using wavelengths in an infrared region (see figure 1, elements 20 and 24, also see column 4, lines 21-25).

However, in light of an updated search, the examiner found Fujita (JP pub no H04-037383), translation provided, in view of McQuade (US pat no 4,956,702), which reads on the claimed invention.

II. Fujita discloses an image extraction method, comprising:

a first image pickup step to pick up an image of an object positioned in front of a background using wavelengths in a visible light region (see figure 1, element 6, which is for visible radiation);

a second image pickup step to pick up an image of the object positioned in front of the background using wavelengths in an infrared region (see figure 1, element 5, for infrared camera); and

using a computer processor extracting only the image of the object based on the images picked up by the first and second image pickup steps (see figure 2, image e and f, shows only the objects, 1 and 2 are extracted).

In the art of infrared imaging, there are many elements which are sensitive to infrared detection, such as thermal energy, like warm blooded animal or color dyes.

McQuade suggests such feature, where three emulsion layers are sensitized to three different portions of the electromagnetic spectrum with at least two layers sensitized to different regions of the infrared region of the electromagnetic spectrum (see column 2, lines 60-67), wherein said emulsion includes silver chloride, silver bromide, silver iodobromide, silver chlorobromide or silver chlorobromiodide (see column 4, lines 37-41). The emulsion layers are picked up by a laser diode imaging apparatus generally indicated as 10 which includes three laser diodes 12, 12a and 12b

which emit radiation in the infrared region of the electromagnetic spectrum and preferably at wavelengths of 780 nm, 830 nm and 880 nm. This infrared radiation is combined into a single beam 14 which is scanned across a photographic element receptor surface 16 by means of a rotating or oscillating single or multi-surface mirror 18.

By coloring the reference position, figure 1, element 3 of Fujita, using the dyes suggested by McQuade, the combination of Fujita and McQuade as a whole discloses the claimed invention of claim 1.

III. The examiner will make new ground of rejections using Fujita (JP pub no H04-037383) in view of McQuade (US pat no 4,956,702). All other arguments presented by the applicant are moot.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita (JP pub no H04-037383) in view of McQuade (US pat no 4,956,702).

With regards to claim 1, Fujita discloses an image extraction method, comprising:

a first image pickup step to pick up an image of an object positioned in front of a background using wavelengths in a visible light region (see figure 1, element 6, which is for visible radiation);

a second image pickup step to pick up an image of the object positioned in front of the background using wavelengths in an infrared region (see figure 1, element 5, for infrared camera); and

using a computer processor extracting only the image of the object based on the images picked up by the first and second image pickup steps (see figure 2, image e and f, shows only the objects, 1 and 2 are extracted).

In the art of infrared imaging, there are many elements which are sensitive to infrared detection, such as thermal energy, like warm blooded animal or color dyes.

McQuade suggests such feature, where three emulsion layers are sensitized to three different portions of the electromagnetic spectrum with at least two layers sensitized to different regions of the infrared region of the electromagnetic spectrum (see column 2, lines 60-67), wherein said emulsion includes silver chloride, silver bromide, silver iodobromide, silver chlorobromide or silver chlorobromiodide (see

column 4, lines 37-41). The emulsion layers are picked up by a laser diode imaging apparatus generally indicated as 10 which includes three laser diodes 12, 12a and 12b which emit radiation in the infrared region of the electromagnetic spectrum and preferably at wavelengths of 780 nm, 830 nm and 880 nm. This infrared radiation is combined into a single beam 14 which is scanned across a photographic element receptor surface 16 by means of a rotating or oscillating single or multi-surface mirror 18.

By coloring the reference position, figure 1, element 3 of Fujita, using the dyes suggested by McQuade, the combination of Fujita and McQuade as a whole discloses the claimed invention of claim 1.

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to consider the teaching of McQuade as a modification to Fujita in order to enhance detection of infrared light by way of organic dye. Doing so will improve detection and recognition between visible light foreground object(s) against infrared background.

With regards to claim 2, the combination of Fujita and McQuade as a whole discloses extracting extracts the object from the image picked up by the first image pickup step depending on color, and extracts the object from the image picked up by the second image pickup step depending on luminance (see Fujita figure 1, uses visible and infrared light reflected to obtain image of the object, 2; McQuade suggests using dye to further sensitize the background area).

With regards to claim 3, McQuade discloses dye has a color selected from a group consisting of blue-green color, gold color and silver color (see column 3, lines 49-58).

With regards to claim 4, McQuade discloses said dye is selected from a group consisting of cyanine organic dyes, phthalocyanine organic dyes, and azo organic dyes(see column 3, lines 49-58).

With regards to claim 10, see the rationale for claim 1.

With regards to claim 11, Fujita discloses using of the camera further comprises using a first camera that captures the first image of the target object using the visible light and using a second cameral that captures the second image of the target object using the infrared light (see figure 2).

3. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita '383 in view of McQuade '702 as applied to claim 1 further in view of Okazaki (US pat no 6,873,713).

With regards to claim 5, see the rationale for clam 1. In addition, the combination of Fujita and McQuade does not disclose a matching section to compare the image

extracted by the extracting section and registered object images, and to output a result of comparison as an authentication result.

Okazaki discloses a matching section to compare the image extracted by the extracting section and registered object images, and to output a result of comparison as an authentication result (see column 3, lines 19 to 33, a plurality of images are taken from different views, the first image taken is read as the image taken from first imager and second image taken is read as the image taken from second imager, the average brightness is compared between the first, second and to the registered image).

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to consider the teaching of Okazaki as a modification to the combined teachings of Fujita and McQuade for the benefit of object matching for security purposes.

With regards to claim 6, see the rationale for claim 2.

With regards to claim 7, see the rationale for claim 5.

With regards to claim 8, see the rationale for claim 3.

With regards to claim 9, see the rationale for claim 4.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEX LIEW whose telephone number is (571)272-8623 or cell (917)763-1192. The examiner can be reached anytime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vu Le can be reached on (571) 272-7332. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alex Liew/
AU2624
3/25/10

/Vu Le/
Supervisory Patent Examiner, Art Unit 2624